

PROCEEDINGS
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THE EASTERN RACES OF THE AMERICAN VARYING
HARE, WITH DESCRIPTION OF A NEW SUBSPECIES
FROM NOVA SCOTIA.

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The American Varying Hare (*Lepus americanus*), with its various forms, occupies the whole of the northern part of North America north to the limit of trees. It is distinctively an inhabitant of the cool, damp, coniferous forest, differing in this respect from its congeners that prefer more open and grassy country.

Its food consists principally of the young, tender shoots of conifers—spruce, fir, etc.—but it also eats the twigs and buds of the alder and other shrubs. In summer, grasses, reeds, and herbaceous plants form part of its diet; but even at this season the young branches and leaves of conifers are generally found in its stomach. Its flesh usually has a strong and, to me, unpleasant sprucey taste.

In eastern North America the Varying Hare may be divided into three geographical races:

1. *Lepus americanus americanus* Erxl., occupying Labrador.
2. *Lepus americanus virginianus* (Harlan), occupying the cool, damp forests and swamps of the Hudsonian, Canadian, and Transition zones. In the Alleghanies it extends south to Virginia and West Virginia.
3. *Lepus americanus struthopus* Bangs, occupying the peninsula of Nova Scotia.

In all three races a white pelage, which is more complete in

northern than southern localities, is assumed at the approach of winter.*

The three eastern races are as follows :

***Lepus americanus americanus* (Erxleben).**

Lepus americanus Erxl. Syst. Anim., p. 330, 1777.

Type locality.—Hudson Strait, south side.

Geographic distribution.—Labrador and perhaps the higher Hudsonian regions of central North America.

Subspecific characters.—Hind foot large; general color of upper parts (in summer pelage) shades of light yellowish brown and drab; a conspicuous white border to ear, all around, even in the young; skull short and broad, not deeply constricted behind postorbital processes; incisor teeth very slender and slightly projected outward.

Color.—Adult in summer pelage: upper parts varying individually from hair-brown and drab to tawny clay color, many black tipped hairs

* This peculiarity of not turning completely white in winter has been given as one of the principal characteristics of the southern race (*L. americanus virginianus*), but it does not seem a difference of any great importance and surely not one on which a subspecies could be based. The problem of how the winter coat is acquired has given rise to a good deal of discussion among naturalists, some taking the view that it is due to a change in the color of the hair itself, and others that it is brought about by a moult. Dr. J. A. Allen (Bull. Am. Mus. of Nat. Hist., vol. VI, p. 107, 1894), who studied the question carefully and with considerable material, is firmly convinced that the latter view is the correct one. It seems to me that the bottom of the question has not yet been reached.

In spring the case is clear enough, and the change from the white winter to the brown summer dress is wholly due to a moult. The long white hairs fall out, leaving the animal clothed in a coat consisting mainly of the under fur, through which can be seen patches of the incoming brown hairs of summer. The case is not so clear in autumn. In late summer we find the adult hares in such short and worn pelage that in places the skin often shows through. When the cool weather of autumn comes and the hares stop breeding, a moult begins, in which the change is not to a white winter dress, but to a long full coat of brown, like that of summer. Before this moult is complete, however, the animal gradually begins to turn white. During this process many of the new hairs are white from the time they first appear, but what happens to the new brown hairs that have just been grown is a question. Does it seem that in the economy of nature these should again be shed before they have served their purpose? If hair and feathers can change color, as many suppose, does it not seem reasonable to assume that the American Varying Hare comes by his winter coat in two ways? Some hairs are white from the time they first appear, but others, which at first are brown, grow to their full length and then change to white.

intermixed along back and on top of head; flanks, arms, pectoral band, and often lower sides, rather brighter, more tawny ochraceous; belly and chin to pectoral band dull white; ears dusky toward tips, bordered by a very conspicuous white band; legs and feet (sometimes hands also) dull white irregularly blotched by patches of tawny and ochraceous-buff; soles dusky, often stained, sometimes having an olivaceous cast. Young not essentially different, except that the legs and feet are not white, but pale tawny or ochraceous-buff. Winter pelage: pure white.

Cranial characters.—Skull short and broad, not deeply constricted behind postorbital processes; nasals wide and flattened on upper surface; incisor teeth very slender and slightly projected outward.

The skull is difficult to tell from that of *L. virginianus*, except by its much more slender incisors, which in all I have examined have never failed to distinguish it.

Measurements.—Averages of nine fully adult specimens of both sexes from Hamilton Inlet (near Rigoulette), Labrador: Total length, 471.33; tail vertebrae, 34.22; hind foot, 146.77. (For individual measurements see table.)

Remarks.—*Lepus americanus americanus* has a more northern and I think a more restricted distribution than has usually been attributed to it. I have seen no specimens except from Labrador. However, it may occur around the shores of James Bay and thence westward into the interior. One specimen collected by Gerrit S. Miller, Jr., at North Bay, Ontario, is apparently an intergrade, though much nearer *virginianus*, since it has the broad incisor teeth and more constricted interorbital region characteristic of that subspecies. In color it is nearer true *americanus*, but the white border of the ears is not as pronounced as in that form. Specimens from Mt. Forest, Ontario, and Lake Edward, Quebec, are nearly alike and differ widely from true *americanus*. In March, 1893, Mr. Will C. Colt collected a series of varying hares for me at Osler, Saskatchewan. All of these specimens are in winter pelage. They are not true *americanus*, and perhaps represent still another race. They are small, with small skulls, having rather narrow nasals and very broad and strong incisor teeth. It thus appears that if true *americanus* finds its way far into the interior of the country, it must be restricted to the high Hudsonian regions near the limit of trees.

L. americanus americanus is very abundant throughout the wooded region of the Labrador peninsula.

I have a series of fourteen specimens collected near Rigoulette, Hamilton Inlet, in the summer of 1895, by C. H. Goldthwaite.

***Lepus americanus virginianus* (Harlan).**

Lepus virginianus Harlan. Fauna Americana, p. 196, 1825.

Type locality.—Blue Mountains, Pennsylvania.

Geographic distribution.—Lower Hudsonian, whole of Canadian and much of Transition zones of eastern North America, except Nova Scotia. From Ontario, Quebec, and New Brunswick it ranges south on the coast

to southern Massachusetts and northern Connecticut and formerly, perhaps, even to New Jersey; in the Alleghany Mountains to Virginia and West Virginia.

Subspecific characters. - Size of or slightly larger than *L. americanus americanus*; hind foot shorter; skull longer and more deeply constricted behind postorbital processes; incisor teeth much broader and more curved backward; general color of upper parts (in summer pelage) shades of rich reddish brown, russet, and dull ferruginous; white border of ear narrow and inconspicuous, often wanting.

Color.—Adult in summer pelage: upper parts varying individually from russet to dull, deep ferruginous, generally with a copious intermixture of black tipped hairs along back and on top of head; belly and chin white; pectoral band colored like back, but without black tipped hairs; ears without white border or with a narrow and inconspicuous one; legs, feet, hands, and arms seldom white, though sometimes irregularly blotched with white or buff. Young, similar to adults. Winter pelage: white, the under fur and some of the longer hairs often retaining part of their color throughout the winter, especially in more southern localities.

Cranial characters.—Skull longer and narrower than that of *L. americanus americanus*; more deeply constricted behind postorbital processes; nasals narrower, longer, and less flattened; incisor teeth broad and strong and more curved backward. The character of the incisor teeth will always serve to distinguish skulls of *L. americanus americanus* from those of *L. americanus virginianus*.

Measurements.—Average of nine fully adult specimens, males and females, from Maine, New Hampshire, and Massachusetts: total length, 475; tail vertebræ, 41.22; hind foot, 140.55 (for individual measurements see table).

General remarks.—*Lepus americanus virginianus* has an extensive distribution, being the form found over the greater part of the range of the species in eastern North America. In the southeastern part of its range, in Massachusetts and Connecticut where it was formerly very common, it is year by year becoming rarer and more local. In this region it is only found in cool, dark woods, extensive tracts of white cedar and white pine being its favorite home. Gradually but steadily, as spots suited to its needs become fewer and smaller, it is being replaced by its more progressive and adaptive cousin, the cotton-tail. Farther north, where the continuous forest of spruce and fir affords it an immense range, it still occurs in great abundance.

Unfortunately, I have seen no specimens from Pennsylvania, nor from the southern Alleghany Mountains. Mr. Thaddeus Surber writes me that it still occurs in the heavy hemlock and spruce forests of some of the higher mountains near White Sulphur Springs, West Virginia.

Lepus americanus virginianus varies but little in the large area it occupies. Specimens from New Brunswick are exactly like those from Massachusetts, and some of the most extreme and richly colored examples I have seen came from Mt. Forest, Ontario, and Lake Edward, Quebec. This is easily accounted for by the animal's peculiar requirements and

mode of life, which are the same throughout its range. In Transition country it only occurs in deep, dark, moist woods, where the conditions are the same as those offered by a much more northern climate. That it has but a weak hold upon a place in the fauna of the Transition zone is shown by the rapidity with which it disappears when the conditions that enabled it to exist there are slightly changed.

I have specimens from Quebec, Ontario, New Brunswick, Maine, New Hampshire, and Massachusetts.

***Lepus americanus struthopus* subsp. nov.**

Type from Digby, Nova Scotia. No. 2025, ♀ ad., coll. of E. A. and O. Bangs. Collected August 4, 1894, by Outram Bangs.

Geographic distribution.—Province of Nova Scotia.

Subspecific characters.—Size of *L. americanus virginianus*; hind foot much smaller; color (in summer pelage) darker and duller, rarely showing the reddish brown shades seen in *virginianus*; otherwise similar to *virginianus*.

Color.—Adult in summer pelage: Upper parts varying individually from raw umber to bistre, sometimes shaded about head, neck, and on flanks with dull ferruginous; black tipped hairs not numerous, often arranging themselves into a narrow dorsal stripe; belly and chin to pectoral band dull white; ears dark brown above, becoming dusky or black at tips, narrowly bordered by a yellowish brown band; hands and feet irregularly marked with dusky and sometimes with whitish blotches. Young similar to adults. Winter pelage, white.

Cranial characters.—The skull of *L. americanus struthopus* is in all essential characters like that of *L. americanus virginianus*. The audital bullæ are constantly a little smaller.

Measurements.—Average of nine fully adult specimens, males and females, from Nova Scotia: Total length, 474.77; tail vertebræ, 49.83; hind foot, 127.38. (For individual measurements see table.)

Remarks.—*Lepus americanus struthopus* is a peninsular form confined to the Province of Nova Scotia. It probably intergrades with *L. americanus virginianus*, though I have seen no specimens from that part of Nova Scotia adjoining New Brunswick. The principal character that distinguishes the Nova Scotia hare is its remarkably small hind foot. The color of the summer pelage is usually much darker and duller than in *L. americanus virginianus*. In my series of twelve in full summer pelage one specimen only is about the color of average specimens of *virginianus*, all the others being much darker. The dusky markings on feet, hands, nape, and top of head so common in *struthopus* are rarely, if ever, present in *virginianus*.

Lepus americanus struthopus is exceedingly abundant throughout the Province of Nova Scotia, except on the hard-wood ridges.

Within a few years this form has been introduced into Newfoundland, and finding there a region exactly suited to its needs, with no indigenous competitor, it has increased with great rapidity, so that now it is quite generally distributed throughout the southern part of the island. I am

told that these hares were caught near Halifax. It will be interesting to watch their career in Newfoundland and see how long it will take the modifying influences of the new island home to work a change. If I might hazard a guess, this will be in the direction of still darker coloration.

Measurements of the eastern races of Lepus americanus (adult specimens).

Locality.	No.	Sex.	Total length.	Tail vertebrae.	Hind foot.
<i>Lepus americanus americanus</i> Erxl.					
Labrador, Hamilton Inlet.....	4152	♂	476	36	155
“ “ “	4153	♂	475	40	150
“ “ “	4160	♂	483	33	142
“ “ “	4164	♂	486	37	152
“ “ “	4154	♂	475	35	146
“ “ “	4156	♂	466	37	143
“ “ “	4161	♂	463	33	150
“ “ “	4155	♂	463	25	142
“ “ “	4163	♂	455	32	141
<i>Lepus americanus virginianus</i> (Harlan).					
Massachusetts, Middleboro.....	1730	♂	452	46	137
New Hampshire, Webster.....	5815	♂	465	44	141
“ “ “	5814	♂	505	44	146
Maine, Bucksport	4245	♂	462	46	131
Maine, Upton.....	4195	♂	475	35	140
Maine, Greenville.....	4963	♂	490	50	149
“ “ “	4967	♂	463	53	139
“ “ “	4966	♂	490	50	142
“ “ “	7273	♂	473	43	140
Ontario, Mt. Forest.....	1785	♂	485	47	147
“ “ “	1786	♂	457	46	133
Quebec, Lake Edward.....	3821	♂	481	44	153
“ “ “	3822	♂	482	49	143
<i>Lepus americanus struthopus</i> Bangs.					
Nova Scotia, James River	2028	♂	483	32	131
Nova Scotia, Digby.....	120	♂	511	50	137.5
“ “ “	121	♂	469	54	125.5
“ “ “	123	♂	461	48	129.5
“ “ “	124	♂	464	51	118
“ “ “	119	♂	479	54.5	125
“ “ “	122	♂	467	55	129
“ “ “ type.....	2025	♂	474	54	125
“ “ “	2026	♂	465	50	126